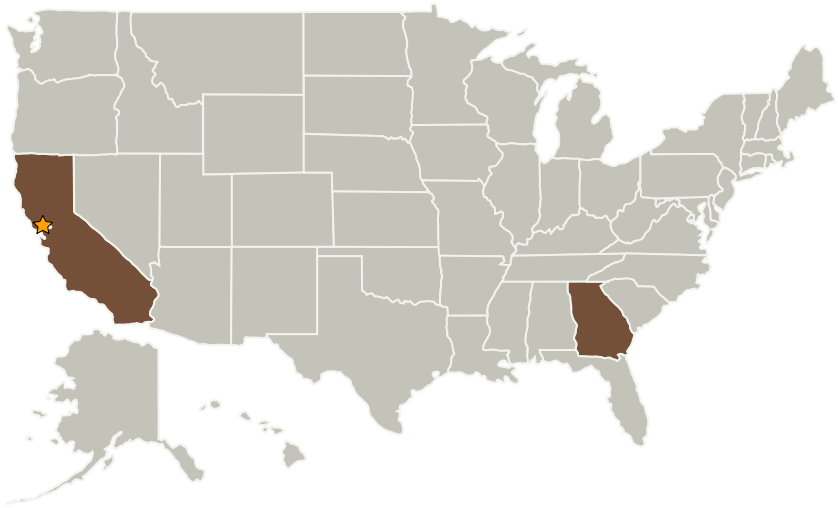
Hierarchical Intelligent Data Fusion Architecture for System Health Management, Phase I

Completed Technology Project (2005 - 2006)

Project Introduction

The complexity of modern systems and the stringent performance requirements for operation and uptime suggest that optimum and robust means must be deployed to make effective use of multiple sensor suites for assessing risk, identifying system degradation, understanding how system degradation progresses to failure, etc. Global Technology Connection and Georgia Tech proposes the development of data fusion architecture based on a hybrid analytical / intelligent methodology that exploits the concept of "focus of attention" via active perception in order to optimize degradation/fault classification accuracy while reducing substantially the computational burden. The fusion scheme incorporates several levels of abstraction: fusion at the data level, the feature level and the sensor level. The overall architecture employs technologies from soft computing, Dempster-Shafer theory and game theory to provide a robust and reliable platform for critical aerospace systems. Phase I effort will develop a data fusion algorithms for system degradation/fault identification. Phase II will address design and construction of prototype field hardware for implementing the data fusion concept for components. Several aerospace end users like Lockheed Martin and Boeing have already expressed interest in the commercial applications (Phase III) of this approach for health monitoring and life determination of Aerospace vehicles/systems.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Global Technology Connection Inc	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Atlanta, Georgia

Primary U.S. Work Locations	
California	Georgia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.2 Intelligent Data Understanding